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Constellation Law Group, PLLC
P.O. Box 220
Tracyton, WA 98393

EXAMINER	
HUYNH, NAM TRUNG	
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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/816,082
Filing Date: March 31, 2004
Appellant(s): JUNG ET AL.

Steven Stewart
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 1/14/10 appealing from the Office action mailed 7/17/09.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

1-26

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

2002/0161751	Mulgund et al.	10-2002
2004/0090326	Chin et al.	5-2004
2005/0140964	Eschenauer et al.	6-2005

Warneke et al. "Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks", UC Berkeley, 1998

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 9, 12-15, 20 and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751) (hereinafter Mulgund) in view of Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks", UC Berkeley, 1998) (hereinafter Warneke).

Regarding claims 1 and 12, Mulgund teaches a method comprising: transmitting at least a part of one or more sensor-addressed content indexes (Node Data Table) (paragraph 42; The Node Data Table is transmitted because the database server can interrogate the node to retrieve it which implies that the table is transmitted by the node in response to the interrogation. The Node Data Table is "sensor-addressed" because an identifier of the node is included (i.e. Node A, B, or C). The Node Data Table is also a "content index" because it contains "contents" such as the type of sensor data known

to originate from the node and is in the form of a table which is equivalent to an "index".) the one or more sensor-addressed content indexes including one of a sensor-addressed sensing index (paragraph 42, The contents of the Node Data Table is considered a "sensing index" because it contains information pertaining to the type of sensor data or "sensing" information in the form of a table or "index".) Additionally Mulgund teaches that the sensing nodes comprise computational devices possibly ranging in complexity from small embedded platforms to fully-fledged PCs (paragraph 26), but does not explicitly teach that the addressed content indexes are transmitted by motes. Warneke teaches millimeter scale sensing and communication platforms which compose a distributed sensor network called dust motes (page 1, lines 1-8). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Mulgund to allow the motes taught by Warneke to be used in the sensing network in order to utilize sensors that provide low cost, low power consumption, and small size.

Regarding claims 2 and 13, Mulgund teaches transmitting at least a part of one or more sensor-addressed content indexes (Node Data Table) further comprises: transmitting at least a part of at least one of a sensor-addressed sensing index (Node Data Table), the at least one of the sensor-addressed sensing index including at least one of a sensing information (type of sensor data known to originate from the node) (paragraph 42). The implementation of a mote for a sensor is taught by Warneke.

Regarding claims 3 and 14, Mulgund teaches transmitting at least a part of one or more sensor-addressed content indexes further comprises: transmitting at least a

part of a sensor-addressed routing/spatial index (Data Table List) (paragraph 42; the Data Table List provides a mapping between individual nodes). The implementation of a mote for a sensor is taught by Warneke.

Regarding claims 4 and 15, Mulgund teaches transmitting at least a part of one or more sensor-addressed content indexes (Node Data Table) further comprises: transmitting at least a part of at least one of a sensor-addressed sensing index (Node Data Table), the at least one of the sensor-addressed sensing index including at least one of a sensing information (type of sensor data known to originate from the node) (paragraph 42), and including at least one of a control function (software application programming interface (API) associated with one or more devices (hardware) contained within the sensor (paragraph 26; The API is considered a control function because it is the software that "controls" the hardware. The hardware of the sensor comprises physical components which renders a "device" within the sensor.). The implementation of a mote for a sensor is taught by Warneke.

Regarding claims 9 and 20, Mulgund teaches transmitting at least a part of one or more sensor-addressed content indexes further comprises: effecting the transmitting in response to a query (interrogation) (paragraph 42). The implementation of a mote for a sensor is taught by Warneke.

Regarding claim 23, the limitations are rejected as applied to claim 1. Furthermore, Warneke teaches that each mote consists of a communication transceiver (transmitting means) and because the transceiver is within the mote, it is considered to be "proximate" (page 1, lines 6-9).

Regarding claim 24, the limitations are rejected as applied to claims 1-4.

Regarding claim 25, Mulgund teaches at least one reporting entity resident on the sensor further comprises: a processor configured to transmit at least a part of said at least one sensor-addressed content index (paragraph 26). The implementation of a mote for a sensor is taught by Warneke.

Regarding claim 26, Warneke teaches the mote comprises: at least one of a processor, a memory, or a communications device formed from a substrate (page 1, lines 6-8).

Claims 5-8 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751) (hereinafter Mulgund) in view of Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks", UC Berkeley, 1998) (hereinafter Waraneke) as applied to claims 1 and 12, and further in view of Chin et al. (US 2004/0090326) (hereinafter Chin).

Regarding claims 5 and 16, the combination of Mulgund and Warneke teaches the limitations set forth in claims 1 and 12, but does not explicitly teach that the transmission of the mote-addressed content indexes are effected in response to a schedule. Chin discloses a wireless sensor network wherein the sensors communicate with one another pursuant to a pre-arranged or self-organized communication protocol and schedule (paragraph 4). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Mulgund and Warneke to allow the motes to distribute information in response to a schedule, as

taught by Chin, in order for the motes to assume a so-called sleep mode during intervening periods and conserve power.

Regarding claims 6 and 17, Chin teaches transmitting in response to a schedule further comprises: means for receiving the schedule (paragraph 16).

Regarding claims 7 and 18, Chin teaches transmitting in response to a schedule further comprises: means for deriving the schedule (paragraph 16).

Regarding claims 8 and 19, Chin teaches the effecting the transmitting in response to a schedule further comprises: deriving the schedule at least in part from at least one of an optimized query or a stored query (paragraph 25).

Claims 10, 11,21, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751) (hereinafter Mulgund) in view of Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks", UC Berkeley, 1998) (hereinafter Warneke) as applied to claims 1 and 12, and further in view of Eschenauer (US 2005/0140964).

The combination of Mulgund and Warneke teaches the limitations set forth in claims 1 and 12, but does not explicitly teach that the mote-addressed content indexes are transmitted utilizing at least one of a private or public key. Eschenauer discloses a method and apparatus for key management in distributed sensor networks (title). Eschenauer teaches that a distributed sensor network including sensors such as Smart Dust sensors (motes), are distributed cryptographic (encryption) keys (paragraphs 3, 9, 44-46). Therefore it would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify the combination of Mulgund and Warneke to allow the motes to utilize distributed keys, as taught by Eschenauer, in order to provide security to the sensor network to prevent unauthorized intrusion.

(10) Response to Argument

VII. ARGUMENT

Appellant asserts that the art of record does not recite the text of Applicant's claims at issue and hence fails to establish a prima facie case of unpatentability. In response to this assertion, the Examiner respectfully submits that the prior art teaches or discloses the concept of the subject matter recited in the claims.

A. MPEP Standards for Patentability

The Examiner agrees with Applicant's characterization of the MPEP standards in sections 1, 2, 2a, 2b, and 2c of the brief.

B. Technical Material Cited by Examiner Mulgund et al. (U.S. Pub. No. 2002/0161751 and Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks") Does Not Show/Suggest Recitations of Independent Claim 1 and Dependent Claims 2-9 as Presented Herein; Notice of Allowance of Same Respectfully Requested

1. Independent claim 1

a) Technical Material Cited by Examiner Does Not Show or Suggest the Text of at Least Independent Claim 1

(1) Examiner Citations With Regard to Clause [a] of Independent Claim 1

Appellant submits that the Examiner identified portions of Mulgund and Warneke do not recite or suggest “transmitting at least a part of one or more mote-addressed content indexes, at least one of the one or more mote-addressed content indexes including at least one of a mote-addressed sensing index or a mote-addressed control index" and that the Examiner has provided no objectively verifiable evidence, or argument based on objectively verifiable evidence, as to why the text of the reference passages should be interpreted to teach the aforementioned limitation.

In response to this submission, the Examiner respectfully disagrees and submits that Mulgund teaches that a database server interrogates a sensing node to retrieve the Node Data Table, wherein the Node Data Table contains information about the type of sensor data known to originate at that node (paragraph 42). A transmission or “transmitting” is taught because the sensor node transmits the Node Data Table to the database server in response to an interrogation. The Node Data Table renders a “sensor-addressed content index” for the following reasons:

1. A table is equivalent to an “index” because they are both data structures for storing or containing data

2. The Node Data Table is “sensor addressed” because it includes identifiers of nodes (i.e. Node A, B, or C)

3. It is a “content index” because it contains data of some kind or sort.

The Node Data Table also renders a “sensor-addressed sensing index” because of the following reasons:

1. A table is equivalent to an "index" because they are both data structures for storing or containing data

2. The Node Data Table is "sensor addressed" because it includes identifiers of nodes (i.e. Node A, B, or C)

3. The Node Data Table is a "sensing index" because it contains information pertaining to the type of sensor data, or sensing information.

In Mulgund, the Node Data Table is transmitted from the sensor node to the database server. The Node Data Table is interpreted by the Examiner as both a sensor-addressed content index and a sensor-addressed sensing index as explained above. Therefore the Examiner submits that Mulgund teaches "transmitting one or more sensor-addressed content indexes wherein the sensor addressed content index includes a sensor-addressed sensing index".

Mulgund additionally teaches that the sensing nodes comprise computational devices possibly ranging in complexity from small embedded platforms to fully-fledged PCs (paragraph 26), which shows that the invention of Mulgund is not limited to the type device used as a sensing node. However, Mulgund does not explicitly recite that the Node Data Table, or addressed content indexes, are transmitted by motes or that the sensing nodes are in fact motes. Warneke cures this deficiency in because Warneke teaches that motes are millimeter scale sensing and communication platforms (page 1, lines 1-8). Based on this definition or teaching, a mote may be considered as a "sensing node" and thus the combination of Mulgund and Warneke is the sensor

network of Mulgund which utilizes motes as the sensing nodes, taught by Warneke, which renders the subject claim limitations.

(2) Examiner Interpretation Appears to be Based on Inadvertent Impermissible Hindsight, Personal Knowledge, or Official Notice; Applicant Requests Issuance of Notice of Allowability

In response to Appellant's argument that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

(3) Examiner Has Put Forth No Evidence Supporting His Characterization That Warneke "Teaches" Recitations of Independent Claim 1

Appellant submits that Warneke does not recite the text “transmitting at least a part of one or more mote-addressed content indexes, at least one of the one or more mote-addressed content indexes including at least one of a mote-addressed sensing index or a mote-addressed control index" and that the Examiner has provided no objectively verifiable evidence, or argument based on objectively verifiable evidence, as to why the text of the reference passages should be interpreted to teach the aforementioned limitation.

In response to this submission, the Examiner respectfully disagrees and submits that this limitation was taught by the combination of Mulgund and Warneke as stated above in (1), not Warneke alone.

(4) Examiner Interpretation Appears to be Based on Inadvertent Impermissible Hindsight, Personal Knowledge, or Official Notice; Applicant Requests Issuance of Notice of Allowability

In response to Appellant's argument that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See In re McLaughlin, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

b) Meet the Recitations of Independent Claim 1 Are a "Mere Conclusory Statement" Without Evidentiary Support/Change the Principle of Operation of Components of Cited References/Render Such Components Unfit for Intended Purpose; No Teaching to Combine/Modify Components as a Matter of Law.

(1) Examiner Assertions Regarding A Teaching to Modify/Combine to Meet the Recitations of Independent Claim 1 Are Based on "Mere Conclusory Statements" Without Evidentiary Support

In response to Appellant's argument that there is no suggestion to combine the references, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation and evidentiary support is found in the secondary reference Warneke on page 1, lines 8-11 which recites that motes are built from integrated circuit and micro-machining processes for low cost, low power consumption, and small size.

(2) Examiner-Suggested Modifications to Meet the Recitations of Independent Claim 1 Change the Principle of Operation of Components Being Modified; No Teaching to Modify/Combine Components as a Matter of Law.

(3) Modifications to Meet the Recitations of Independent Claim 1 Render Components Being Modified Unsatisfactory for their Intended Purposes; No Teaching to Modify/Combine Components as a Matter of Law.

In response to Appellant's argument that the combination of Mulgund and Warneke renders components being modified unsatisfactory for their intended purposes and that there would need to be some type of reconstruction and/or redesign - appropriate to the capabilities of the network structure and method of Mulgund to provide for the mote network of Warneke, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the

primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

2. Dependent Claims 2-9: Patentable for at Least Reasons of Dependency from Independent Claim 1.

Appellant submits that Dependent claims 2-9 are patentable for at least the reasons why Independent Claim 1 is patentable. The Examiner submits that Independent Claim 1 is not patentable for the reasons set forth above.

1. Dependent Claim 2 is Independently Patentable

Appellant submits that the combination of Mulgund and Warneke does not teach "transmitting at least a part of one or more mote-addressed content indexes further comprises: transmitting at least a part of at least one of a mote-addressed sensing index or a mote- addressed control index, the at least one of the mote-addressed sensing index or the mote- addressed control index including at least one of a sensing information or a control information other than data collected by a mote". The Examiner respectfully disagrees. In the combination of Mulgund and Warneke, the mote-addressed content index and mote-addressed sensing index is rendered by the Node Data Table transmitted by a mote. The Node Data Table contains the type of sensor data known to originate from the node (Mulgund paragraph 42). The type of sensor data renders "sensing information" because it is information regarding the sensor.

2. Dependent Claim 3 is Independently Patentable

Appellant submits that the combination of Mulgund and Warneke does not teach "transmitting at least a part of one or more mote-addressed content indexes further comprises: transmitting at least a part of a mote-addressed routing/spatial index". The Examiner respectfully disagrees. Mulgund teaches that the database server can retrieve a Links Table which contains Node Addresses identifying the nodes at each end of each link is also collected or obtained from the sensing nodes (paragraphs 38, 61). The Links Table renders a routing/spatial index because it shows interconnectivity between the sensors (i.e. how they are connected with respect to each other).

3. Dependent Claim 4 is Independently Patentable

Appellant submits that the combination of Mulgund and Warneke does not teach "transmitting at least a part of one or more mote-addressed content indexes further comprises: transmitting at least a part of at least one of a mote-addressed sensing index or a mote-addressed control index, the at least one of the mote-addressed sensing index or the mote- addressed control index including at least one of: a sensing information or a control information other than data collected by a mote and including at least one of: a format used to query one or more devices contained within a mote, a control function associated with one or more devices contained within a mote, or a feedback format associated with a feedback provided by one or more devices contained within a mote". The Examiner respectfully disagrees. Mulgund teaches that the Node Data Table defines the type of information for which the sensor provides (paragraph 42). This information renders a "control function associated with one or more devices contained within the mote" because the information defines how the sensor is controlled

(i.e. a temperature sensor is controlled to measure temperature type data). The information would also describe how the components, or one or more devices contained within the mote, are controlled.

C. Technical Material Cited by Examiner (Mulgund et al. (U.S. Pub. No. 2002/0161751) in view of Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks") Does Not Show/Suggest Recitations of Independent Claim 12 as Presented Herein; Notice of Allowance of Same Respectfully Requested

1. Independent Claim 12

a) Technical Material Cited by Examiner Does Not Show or Suggest the Text of at Least Independent Claim 12

The arguments applied to claim 1 above are also applicable to this claim.

2. Dependent Claims 13-20: Patentable for at Least Reasons of Dependency from Independent Claim 12.

Appellant submits that Dependent claims 13-20 are patentable for at least the reasons why Independent Claim 12 is patentable. The Examiner submits that Independent Claim 12 is not patentable for the reasons set forth above.

1. Dependent Claim 13 is Independently Patentable

The arguments applied to claim 2 above are also applicable to this claim.

2. Dependent Claim 14 is Independently Patentable

The arguments applied to claim 3 above are also applicable to this claim.

3. Dependent Claim 15 is Independently Patentable

The arguments applied to claim 4 above are also applicable to this claim.

D. Technical Material Cited by Examiner (Mulgund et al. (U.S. Pub. No. 2002/0161751) in view of Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks") Does Not Show/Suggest the Recitations of Independent Claim 23 as Presented Herein; Notice of Allowance of Same Respectfully Requested

1. Independent Claim 23

The arguments applied to claim 1 above are also applicable to this claim. In addition, Warneke teaches that each mote consists of a communication transceiver (page 1, lines 6-9). This transceiver renders a "transmitting means" and because the transceiver is within the mote, it is considered to be "proximate".

E. Technical Material Cited by Examiner (Mulgund et al. (U.S. Pub. No. 2002/0161751) in view of Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks")) Does Not Show/Suggest the Recitations of Independent Claim 24 as Presented Herein; Notice of Allowance of Same Respectfully Requested

1. Independent Claim 24

The arguments applied to claim 1 above are also applicable to this claim.

2. Dependent Claims 25-26: Patentable for at Least Reasons of Dependency from Independent Claim 24.

Appellant submits that Dependent claims 24-26 are patentable for at least the reasons why Independent Claim 24 is patentable. The Examiner submits that Independent Claim 24 is not patentable for the reasons set forth above.

F. Technical Material Cited by Examiner Mulgund et al. (U.S. Pub. No. 2002/0161751 and Warneke et al. ("Ultra-Low Power Communication Logic Circuits for Distributed Sensor Networks") and Eschenauer Does Not Show/Suggest Recitations of Dependent Claims 10, 11, 21 and 22: Patentable for at Least Reasons of Dependency from Claims 1 and 12.

Appellant submits that Dependent claims 10, 11, 21, and 22 are patentable for at least the reasons why Independent Claims 1 and 12 are patentable. The Examiner submits that Independent Claims 1 and 12 are not patentable for the reasons set forth above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Nam Huynh/

Examiner, Art Unit 2617

Conferees:

/George Eng/
Supervisory Patent Examiner, Art Unit 2617

/Charles N. Appiah/
Supervisory Patent Examiner, Art Unit 2617